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CONTAGIOUS DISEASES
THEIR PREVENTION AND CONTROL IN
CHILDREN'S INSTITUTIONS

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SUPPLEMENT No. 6
TO THE
PUBLIC HEALTH REPORTS

APRIL 11, 1913

[Second Edition]



WASHINGTON
GOVERNMENT PRINTING OFFICE
1913

222320 EDUCATION
IN AMERICA AND IN THE WORLD
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CONTAGIOUS DISEASES.

THEIR PREVENTION AND CONTROL IN CHILDREN'S INSTITUTIONS.

By JAMES P. LEAKY, Assistant Surgeon, United States Public Health Service.

Not the least of the many cares which beset those who are intrusted with a considerable number of children is the anxiety lest one of the contagious diseases break out among their charges. Although some of these "children's diseases" are usually mild, there is none that may not be serious, and we are now well aware that measles and whooping cough, often thought to be unimportant diseases, are frequently serious in their results. The prevention of these various diseases lies largely in the avoidance of contact with the infection. In order to carry out this prevention it is necessary to isolate cases from the rest of the children on the appearance of the very first symptoms of the disease, and therefore it behooves those who take care of the children to be keen to observe slight indispositions, which may be the earliest signs of trouble. Children are, however, much more delicately balanced than adults, and are prone to slight illnesses of an indefinite nature. If every departure from normal were strictly quarantined—while doubtless much good would be accomplished in preventing the spread of some of the slight illnesses which are often contagious—the routine of the institution would be so frequently interrupted that without prohibitive expense no systematic instruction or management could be carried out.

Partly on account of the danger from the acute contagious diseases institutional life for children has often been held to be unhygienic, but the experience of numerous well-conducted asylums and boarding schools has shown that when properly conducted an institution may be more nearly exempt from children's diseases than are day schools.

The diseases which we shall consider are measles, scarlet fever, diphtheria, whooping cough, mumps, German measles (a better name for which is rubella), and chicken pox. In general, a child who develops an illness of any sort should be kept from other children as much as possible until it is definitely known what ails him, but children who show the beginning symptoms of the above diseases should be immediately and completely isolated and placed under proper supervision. It is well known that the beginning catarrhal stage of measles and the initial vomiting of scarlet fever are contagious, even though the eruption or "breaking out" on the skin does not appear for some

time. In the first five of the diseases mentioned above the contagion is probably spread by the moist, invisible particles thrown from the throat in coughing or speaking. The sneezing of the initial stage of measles is particularly infectious. We can thus understand how these diseases may be catching before anyone is able to make a definite diagnosis. The institutions which recognize this fact, and act on it, are most successful in protecting their charges from infection. Furthermore, just as we know that typhoid fever, diphtheria, and cerebro-spinal meningitis may be contracted from persons who themselves show no signs of disease, so it is probable that scarlet fever, German measles, and mumps may be brought into an institution by those who are about to be sick, or who have just recovered, or even by persons who remain practically well. It is the intimate contact, especially indoors, that constitutes the chief danger from epidemic diseases in institutions.

Much reliance can be placed on the quarantine of all children admitted to the institution for a period of three weeks before they are allowed to mingle with other children. This is best carried out in a separate building, which should have its own staff of attendants and separate rooms which may be used to isolate cases of suspected contagious diseases among the regular inmates. The length of time between the date when the disease is "caught" and the date of the first symptoms varies with the different infections. This "incubation period" for measles and whooping cough is, roughly, from one to three weeks; in scarlet fever, one to seven days; in diphtheria, two to five days; in mumps, rubella, and chicken pox, two to three weeks. While under this preliminary observation all children should be examined by the physician, and should have cultures taken of nose and throat to exclude carriers of diphtheria. Visitors, even adults, are not without danger as bearers of infection, and all children with coughs or running ears or noses should be rigidly kept away. Among other sources of danger, milk and toilet articles, such as towels and brushes, must be kept in mind. Use of the latter by more than one child should never be permitted, and the only safe rule for milk is to enforce thorough pasteurization.

Measles at first bears some likeness to a common cold, but the child is usually sicker than would be expected. A good criterion is the clinical thermometer, which everyone having charge of numbers of children should be able to use. One end of this instrument has a slender silvery bulb; this end should be placed under the patient's tongue and the lips kept entirely closed for one to three minutes by the watch. Some thermometers are sold as "one-minute" or even "half-minute," but these rapid ones are very easily broken in the child's mouth, and unless reliably certified to be more rapid, the thermometer should be kept under the tongue for a longer time. It is

important that the child shall not have taken a cool or hot drink for 15 minutes before the thermometer is used. In the case of very young or nervous children instead of taking the mouth temperature the thermometer bulb may be placed deep in one arm pit and the arm held close to the side for at least three minutes. It is the "reading" of the thermometer that offers the chief difficulty in its use at first. Clinical thermometers are usually provided with a magnifying stem, so that the height of the mercury is more readily seen; when the sharply convex edge of the stem is held directly opposite the eye the column of mercury in the tube will appear broader and its height can be easily read from the scale. The thermometer should be kept in a strong antiseptic solution such as 5 per cent carbolic acid; before using, it should be wiped dry and the mercury vigorously shaken down in the bulb until below 97°.

Any child sick with a cold or sore throat should have its temperature taken; if this is over 100.5°, measles must be considered, especially if the eyes are red or watery and there is a cough. An improvement in the child's condition is not to be taken as pointing against measles, as this is frequently seen before the rash comes out. The more severe the catarrh and the cough the more dangerously contagious the child is, and complete isolation should be enforced until it is known that the case is not one of measles.

Scarlet fever also begins with a fever, the same degree, 100.5, being a useful criterion here. The first symptom is usually sore throat or vomiting, and either of these two occurrences in children should be looked upon with extreme suspicion. Headache and a coated tongue are also frequent, but in the cases which do not begin with vomiting, a slight sore throat may be the only sign. It is important, then, both in scarlet fever and in diphtheria, which is considered in the next paragraph, that observation be keen, tender, and constant enough to detect the indisposition even before a complaint is made by the child.

Diphtheria is often thought of as a severe sore throat. On the contrary, the throat symptoms at first tend to be milder and the temperature lower than in ordinary tonsilitis. General languor and weakness, however, are more noticeable in diphtheria, although the pain on swallowing may not be marked. It must be emphasized again that every sore throat in children, and above all, in a children's institution, justifies medical attention.

There is another form of diphtheria which is more frequent in younger than in older children; this is laryngeal diphtheria, formerly called membranous or true croup. Most mothers are familiar with the so-called false croup, or catarrhal spasm of the larynx; the only serious side of this common disease is its mimicry of laryngeal diphtheria. Laryngeal diphtheria can be distinguished from false croup

principally by the fact that the child becomes progressively worse. In false croup there is usually no difficulty in breathing until the sudden, suffocating spasm comes on—oftenest in the middle of the night. After the attack, except for hoarseness, the child is practically well. In laryngeal diphtheria, however, there may be no spasm at any time; besides hoarseness and a barking cough, which occur also in false croup, the child wheezes even after slight stirring around and uses considerable muscular effort in taking in and expelling its breath. In severe cases it is evident that not enough air is reaching the lungs.

As soon as difficulty in breathing is seen in a child the physician should be sent for without a moment's delay. There are few conditions in medicine in which prompt action will save so many lives. Cases of hoarseness with a croupy cough in a children's institution are sufficiently suspicious to demand medical attention within 24 hours. Still another form of diphtheria must be considered largely from the opposite point of view, that of danger to other children; this is diphtheria of the nose. Discharges from the nose which keep up for a week or which cause the nostrils to become sore, should be regarded with suspicion until a culture has proven that they are not due to diphtheria, the child meanwhile being kept apart from others. In nasal diphtheria there may be no other symptoms, or none which might not be those of a common cold.

Whooping cough is insidious in its onset. For this reason no person who develops coughing spells should be allowed the freedom of a children's institution, as it may be three or four weeks before the typical whoop is heard. It is characteristic of whooping cough, even before the whoop develops, that the cough comes in spells. In learning to recognize the whoop the most efficient teacher is a child sick with the disease. The little patient often feels a seizure coming on, and runs to a chair or to an adult for support. The coughing becomes so severe and so frequent that there is not opportunity to breathe, the face and hands sometimes are purple, and finally through the partially closed throat a long breath is drawn with difficulty, producing the sound which is called the "whoop." After this, mucus is expectorated and frequently the child vomits. The attack is usually repeated immediately. These double or even triple seizures occur several times a day, though in some patients the disease progresses from beginning to end without a whoop. The decline of the infection is even more gradual than its onset. For weeks or months coughing spells continue, becoming less intense and less frequent until recovery is complete.

Mumps usually offers little difficulty; the swelling comes on suddenly, lies in front of the ear, and is painful when the jaw is opened wide or when a small spoonful of vinegar is taken in the mouth.

German measles should be called rubella, because it is an entirely separate disease from measles. Chicken pox and rubella may first show themselves by the eruption, so that the only rule which can be laid down is that every child who breaks out with a rash should be isolated. A comparison of typical cases of the different eruptions will, however, give some indication as to what may be looked for.

In chicken pox one finds scattered irregularly over the body small red spots which in a few hours or at times in less than an hour become raised hemispheres filled with a straw-colored fluid, sometimes with so little inflammation that they resemble drops of water. There may be only a few of these "vesicles" or the skin may be rather thickly dotted with them. In a day or two the "vesicles" begin to dry up and heal with a scab, or their contents may first be changed to thicker, yellowish matter. They tend to come in crops, so that some are drying up as others are coming out. The rash in rubella consists of fine pink or rose-red dots somewhat larger than the head of a pin, spread thickly over the body surface. In scarlet fever the eruption is similar to that of rubella, but the dots are finer, a brighter red, and are especially marked in the folds of the body, while sparing the region immediately around the lips. This, by contrast, causes the mouth to look pale. Usually the dots are so close together that the appearance is given of an intense blush. In measles, on the other hand, the spots are larger, come out first on the face and remain most prominent there. This, together with the catarrh of the eyes and nose, causes the face to appear blotchy, the common expression being to some extent justified that measles makes a handsome child ugly, while scarlet fever makes an ugly child handsome.

To summarize the conditions which would call for isolation and special attention: A sore throat should make one think of scarlet fever or diphtheria; a persistent discharge from the nose, of diphtheria; a catarrh or cough with fever, of measles; vomiting with fever, of scarlet fever; weakness or lassitude in a child previously well, of diphtheria; a cough which comes in spells, of whooping cough; a croupy cough, of laryngeal diphtheria; a rash on the skin, of measles, scarlet fever, rubella, or chicken pox.

These are general directions. Even by a rigid adherence to them some unusual or mild cases may be overlooked, but every scheme of prevention must be weighed as to feasibility and these precautions can be depended upon to materially diminish the probability of an epidemic.

